REMARKS

In response to the Examiner's Action of 12/27/2004, please amend as shown in the Amendment to the Claims Section. Please cancel claims 31-34 without prejudice to the filing of such claims in another application during the pendency of this application.

No new matter has been added by the amendment.

Rejections Under 35 U.S.C. §101 and §112

Claims 1-30 stand rejected under 35 U.S.C. §112, second paragraph, as failing to set forth the subject matter which the applicant regards as his invention on grounds that the term "predetermined" is indefinite in claims 1, 2 and any other claim in which the term is used.

The applicant has obviated this grounds of rejection by deleting the term from claims 1 and 2. The term was not used in any other claims. Removal of this grounds of rejection is requested.

Claims 1-30 stand rejected because the independent claims are vague on grounds that the applicant claims a component selected from fly ash or silica fume yet the claim itself teaches specific amounts of each component as if it is a required component of the claim. This grounds of rejection is respectfully traversed and reconsideration is requested.

Since claim 1 is typical of the objected-to wording, the applicant will discuss claim 1 only since the same argument applies to all of the applicant's other independent claims.

The paragraphs in question are as follows:

(c) a particulate material selected from the group consisting of fly ash, silica fume and mixtures thereof; ....

wherein an amount of the fly ash <u>if present</u> does not exceed about 8% of the packageable dry blended cementitious matrix composition, and

wherein an amount of the silica fume <u>if present</u> does not exceed about 5% of the packageable dry blended cementitious matrix composition.

Paragraph (c) means, of course, that either (1) fly ash is present or (2) silica fume is present, or (3) both fly ash and silica fume are present.

The next paragraph above merely adds that <u>if fly ash is present</u>, with or without silica fume, then the amount of fly ash can not exceed about 8% of the packageable dry blended cementitious matrix composition.

The next paragraph above merely adds that <u>if silica fume is present</u>, with or without fly ash, then the amount of silica fume can not exceed about 5% of the packageable dry blended cementitious matrix composition.

Therefore, it is believed the meaning of the claim is clear and not indefinite and no amendment is necessary. Accordingly, removal of this grounds of rejection is requested.

Claims 1-30 also stand rejected under 35 U.S.C. §112, second paragraph as being made indefinite by the term "<u>packaged</u> dry blended cementitious matrix composition" and also under 35 U.S.C. §101 on grounds that it is unclear if a "package", which is an article, or a "composition" is being claimed in claims 1, 2, 7 and 24.

The word "packaged" has been replaced by the word "packageable" by this amendment to make it clear that it is the composition that is being claimed. The applicant believes that the amendment has obviated this grounds of rejection and it is clear that the composition is being claimed. Accordingly, removal of this grounds of rejection is requested.

Claims 1-30 stand rejected under 35 U.S.C. §112, second paragraph as being made indefinite by the term "decorative aggregate". The Office Action suggests the wording "an aggregate used for a decorative purpose".

It is believed that one skilled in the art will have no difficulty in understanding what is meant by "decorative aggregate" as applicant has defined the term in the application and especially on pages 9-10 and 15. The term is used in the industry without confusion.

Decorative aggregate generally costs substantially more than aggregate used merely for strength and one skilled in the art will not incur the additional cost of decorative aggregate if the purpose is not to produce a decorative aggregate-containing surface.

The applicant believes the suggested terminology "an aggregate used for decorative purpose" has the same meaning as the phase "decorative aggregate" and therefore no amendment is believed to be necessary. Nevertheless, it is believed that the Office Action has suggested that if the wording "an aggregate used for a decorative purpose" is used in the claims that will obviated the rejection. Because the two expressions are believed to have the same meaning, the claims have been amended to the alternative wording. Accordingly, reconsideration and removal of this grounds of rejection is requested.

The term "Type V hydraulic cement" has been changed to "Type 5 portland cement" in the claims as required by the Examiner in the Office Action.

It is believed that the above amendment of the claims obviate all of the §101 and §112 rejections and satisfy the requirements of §101 and §112, second paragraph. Accordingly, removal of all rejections under 35 U.S.C. §101 and §112 is requested.

Rejections Under 35 U.S.C. 102 and 103

Claims 1-30 stand rejected under 35 U.S.C. §102(a and b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Ramme et al. '336B1, Dingsoyr '060, Garrett '802B1, and Sato et al. (JP0615115-abstract only) on grounds that:

> "All of the above cited references teach a cementitious composition comprising the same components as claimed by the applicant in overlapping amounts thus anticipating the invention. Even if not anticipated, overlapping ranges of amounts would have been prima facie obvious to one of ordinary skill in the art.
>
> Also, the use of a dry blend versus adding water to a cement mixture would have been an obvious design choice for one of ordinary skill in the art. It would have been obvious to package dry mix prior to adding water because it is understood that water will activate the cement setting.
>
> It is also old in the art to add conventional additives such as superplasticizers because it is commonly used in cement."

This grounds of rejection is respectfully traversed and reconsideration is requested.

It is believed that it would be helpful to review the cited references.

U.S. Patent No. 6,821,336 B1 to Ramme et al.

Ramme et al. disclose two types of cementitious compositions both having increased electrical conductivity, and both comprising portland cement and carbon fibers, -- namely (1) a concrete, and (2) a controlled low-strength material or "CLSM".

The Concrete of Ramme et al.

Ramme et al. teach (Col. 4, lines 21-42) that one example embodiment of the invention is a composition capable of setting to produce a concrete wherein the composition includes:

(1) from about 1% to about 30% by weight portland cement,

(2) from about 1% to about 30% by weight fly ash having a carbon content as measured by loss on ignition of greater than 12%,

(3) from about 40% to about 90% by weight aggregate,

(4) from about 0.1% to about 20% by weight carbon fibers, and

(5) water in a sufficient amount such that the composition sets to a concrete having a compressive strength of at least 13.8 MPa (2000 psi), wherein all weight percentages are by weight of the total composition.

The CLSM of Ramme et al.

Ramme et al. teach (Col. 5, lines 50-64) that one example embodiment of the invention is a self-compacting, cementitious flowable fill composition, capable of setting to produce a controlled low-strength material or CLSM, wherein the composition includes:

(1) from about 1% to about 30% by weight portland cement,

(2) from about 5% to about 85% by weight fly ash,

(3) from about 0.1% to about 20% by weight carbon fibers, and

(4) water in a sufficient amount such that the composition sets to a material having a compressive strength of 8.3 MPa (1200 psi) or less.

Both the concrete and CLSM of Ramme et al. require and contain carbon fibers. There is no disclosure nor suggestion in Ramme et al. that their compositions will serve the purpose they are intended for, i.e. increased electrical conductivity, without the inclusion of carbon fibers. In fact removing the carbon fibers

from the compositions of Ramme et al. is a teaching away from the intended use of their compositions.

None of the applicant's claimed compositions require or call for carbon fibers to be in the compositions. Therefore, it is respectfully submitted that Ramme et al. can not anticipate any of the compositions claimed in the applicant's claims.

Furthermore, there is no disclosure nor suggestion in Ramme et al. that omission of the carbon fibers from their compositions will allow such modified compositions to serve as an effective premix for producing a slurry with an aggregate used for a decorative purpose and water, which then is useful for producing a decorative aggregate-containing surface suitable for light pedestrian traffic. It is not believed that one skilled in the art would be motivated by the increased electrical conductivity compositions of Ramme et al. to modify their compositions by omitting carbon fibers and adjusting the amounts and quality of the other components of Ramme et al. to produce the applicant's premix compositions as claimed in independent claims 1, 2 and 24; and then to produce a slurry from such premix compositions, and an aggregate used for decorative purpose and water to produce decorative aggregate-containing surfaces as claimed in applicant's independent claims 25 and 47 when there is no mention of producing a decorative aggregate-containing surface in Ramme et al. Accordingly, it is believed that a prima facie case of obviousness has not been established and that independent claims 1, 2, 24, 25 and 47 are not made obvious by Ramme et al..

Additional reasons for finding applicant's claims not made obvious by Ramme et al. follow.

Concrete

Concrete is defined in Webster New Collegiate Dictionary, 1979, page 232, as a hard strong building material made by mixing a cementing material (as portland cement) and a mineral aggregate (as sand and gravel) with sufficient water to cause the cement to set and bind the entire mass.

Portland Cement Association publication entitled Design and Control of Concrete Mixtures, 14th Edition, 2002, page 1, states that

> "Concrete is basically a mixture of two components; aggregates and paste. The paste, comprised of portland cement and water, binds the aggregates (usually sand and gravel or crushed stone) into a rocklike mass as the paste hardens because of the chemical reaction of the cement and water".

Therefore, it is believed to be generally understood that in concrete there is both a coarse aggregate, for example gravel or crushed stone, and a fine aggregate such as sand.

With regard to the concrete of Ramme et al., they require their concrete to contain 40%-90% aggregate, preferably 60%- 80% aggregate, and most preferably a mixture of 30%-40% coarse aggregate and 30%-40% fine aggregate. Col. 4, lines 54-65.

Ramme et al. teaches that:

> "The coarse aggregate conventionally comprises particles that are greater than about 0.375 inches (9.5 millimeters) in size and may be gravel, granite, limestone, shale and the like. The fine aggregate employed in portland cement concretes is most often sand (silica) comprised of particles less than about 0.375 inches (9.5 millimeters) in size, typically equal to or

less than about 0.1875 inches (4.76 millimeters) in size." Col. 4, lines 13-20."

Thus there is no disclosure in Ramme et al. that their concrete does not contain coarse aggregate, nor is there a suggestion in Ramme et al. that their concrete should not contain coarse aggregate.

Applicant's claim 1 for a packageable dry blended cementitious matrix composition requires in addition to cement, two components, namely,

(1) a quartzitic silica blend, and

(2) fly ash or silica fume or both,

neither of which are generally considered to be a coarse aggregate since all of these components are smaller than 3/8 inch.

It is well known that fly ash and silica fume are not coarse aggregates. For example, fly ash is described in Design and Control of Concrete Mixtures, 14th Edition, 2002, as a powder resembling cement (page 58, FIG. 3-3, copy enclosed). Silica fume is also referred to in the same publication as microsilica (page 60, copy enclosed).

Accordingly, it is respectfully submitted that since applicant's claim 1 does not have a coarse aggregate nor carbon fibers, that Ramme et al. concrete does not, and can not, make applicant's claim 1 obvious.

Regarding the applicant's independent claim 2, which employs the transitional phrase "consisting essentially of", the applicant has stated what is meant by the wording "consisting essentially of" on page 34 of the application. Thus, the claim language of claim 2, namely, "the packageable dry blended cementitious matrix composition <u>consisting essentially of</u>" excludes the inclusion of an

ingredient not specifically recited unless permitted as a qualified exceptions on page 34 of the instant application. Therefore, applicant's claim 2 is not open to the inclusion of coarse aggregate, or gravel, granite, limestone, or shale.

Applicant's independent claim 24, which also claims a packageable dry blended cementitious matrix composition, uses the transitional phrase "consisting of" which also excludes the inclusion of other ingredients (except for impurities ordinarily associated therewith) not specifically recited. Thus, applicant's claim 24 is not open to the inclusion of coarse aggregate, or gravel, granite, limestone, or shale.

Therefore, these are additional reasons why it is believed that applicant's independent claims 1, 2 and 24 for a packageable dry blended cementitious matrix composition are not made obvious by the concrete of Ramme et al.

CLSM

Turn now to the controlled low-strength material or CLSM of Ramme et al., they teach that their CLSM shares properties with both soils and concrete. The CLSM is prepared from materials (i.e. portland cement, water, optionally coarse aggregate, and optionally fine aggregate) similar to the concrete described above (in Ramme et al.) but also exhibits properties of soils. As claimed by Ramme et al., when water is added to their CLSM formulation it sets to a compressive strength of about 8.3 MPa (1200 psi) or less, and in one embodiment to 2.1 MPa (300 psi). (Col. 5, lines 20-40 and claim 10.)

Unless a composition that has the properties of soils is desired, it is respectfully submitted that one skilled in the art is not going to motivated from the teaching of Ramme et al. to start with the CLSM of Ramme et al., delete the carbon fibers,

select the optional fine aggregate but ignore the optional coarse aggregate to arrive at the applicant's packageable dry blended cementitious matrix composition of his independent claims 1, 2 and 24.

Nor is one skilled in the art from the teaching of Ramme et al. going to be motivated to use a modified CLSM to form a decorative aggregate-containing cementitious <u>slurry</u> as claimed in applicant's of his independent claims 25 and 47.

Ramme et al. do not disclose nor suggest that their compositions can be used as is, or modified, to form the packageable dry blended cementitious matrix <u>composition</u> as claimed in independent claims 1, 2 and 24 to form a <u>slurry</u> with an aggregate used for decorative purpose and water as claimed in applicant's independent claims 25 and 47, for producing a decorative aggregate-containing surface suitable for light pedestrian traffic.

Nor do Ramme et al. disclose or suggest that their <u>slurry</u> compositions can be modified by adding an aggregate used for a decorative purpose to produce a decorative aggregate-containing surface suitable for light pedestrian traffic.

The question to be asked is where is the motivation for one skilled in the art to look for a cementitious composition formulated for a particular characteristic (increased electrical conductivity) and for a particular utility (providing an electrical pathway for grounding of equipment from stray currents or lightening strikes and other increased electrical conductivity usages) in the prior art, then remove the component (carbon fibers) in such cementitious composition that contributes to the particular characteristic in the prior art composition so that it is closer to applicant's claimed composition, and use the thusly modified

composition for a new purpose (for producing a decorative aggregate-containing surface suitable for light pedestrian traffic), when such use was of no concern in and of the prior art composition. For example, there is no mention of cementitious matrix composition for producing a decorative aggregate-containing cementitious slurry, or a slurry for producing a decorative aggregate-containing surface in Ramme et al. It is respectfully submitted that the motivation to do so is nonexistent in Ramme et al. and holding applicant's composition obvious would seem to be "hindsight" based on the applicant's own disclosure.

> The facts that a prior art device could be modified so as to produce the claimed device is not a basis for an obviousness rejection unless the prior art suggested the desirability of such a modification. In re Gordon, 221 USPQ 1125 (Fed. Cir 1984).

Therefore, it is respectfully submitted that the rejection of the applicant's claims based on Ramme et al. ignores the teaching and fair suggestion in Ramme et al.

(1) that all of their compositions, i.e. concrete and CLSM, require the inclusion of carbon fibers, and

(2) that there is no disclosure nor suggestion that their compositions would be useful for producing a decorative aggregate-containing surface suitable for light pedestrian traffic.

It is respectfully submitted that:

> The ever present question in cases within the ambit of 35 U.S.C. 103 is whether the <u>subject matter as a whole</u> would have been obvious to one of ordinary skill in the art following the <u>teachings</u> of the prior art <u>at the time the invention was made</u>. It is impermissible within the framework of section 103 to pick and choose from any one reference only

so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. In re Rothermel, 47 CCPA 886, 276 F.2d 393, 125 USPQ 328; In re Wesslau, 147 USPQ 391, 393, 353 F.2d 238.

Relative to rejections predicated on 35 U.S.C. 103, prior patents are references for only what they clearly disclose or suggest. In re Randol and Redford 165 USPQ 586 (CCPA, 1970).

Accordingly, it is believed that all of the applicant's claims now in the application are allowable over Ramme et al. and allowance is requested.

****

U.S. Patent No. 4,935,060 to Dingsoyr

Dingsoyr discloses a cement slurry for cementation of oil wells, and in particular for the for cementation of oil wells which are drilled through high pressure formations using high density slurries in order to avoid uncontrolled blow-out. (Col. 1, lines 45-47).

Dingsoyr also discloses that high density cement slurries are produced by adding an inert high density filler material such as for example barite. (Col. 2, lines 46-48).

Dingsoyr's high density cement slurry consisting essentially of:

(1) - - - a hydraulic cement, and base on the weight of the cement the following additional components:

(2)	5-85%	microsilica,
(3)	5-250%	high density filler selected from the group consisting of barite, hematite and ilmenite,
(4)	0-5%	of a retarder (dry weight),
(5)	0-12%	thinner (dry weight),
(6)	0-8%	fluid loss additive (dry weight),
(7)	0-45%	silica material selected from the group consisting of silica flour and silica sand, and
(8)	- - -	water in such an amount that the cement slurry has a density between 1.95 and 2.40 g/cm^3. (Col. 3, lines 7-19 and 55-57, and Claim 1).

Barite is barium sulfate and has a density of 4.5 g/cm^3; hematite is iron (III) oxide having a density of 5.24 g/cm^3, and ilmenite is iron titanium oxide $FeTiO_3$ having a density of 4.44 - 4.94 g/cm^3; all three are minerals and/or ores. McGraw-Hill, Dictionary of Scientific and Technical Terms, 1994.

These three materials are not shown nor alleged in the instant Office Action to have any particular property or significance, or be equivalent to any of the components in the applicant's packageable dry blended cementitious matrix composition as claimed in independent claims 1, 2 and 24, nor the applicant's decorative aggregate-containing cementitious slurry as claimed in independent claims 25 and 47.

Neither barite, nor hematite, nor ilmenite, nor any other high density material is required or called for in the applicant's claims. Since these materials are high density minerals it is not believed they would serve any useful purpose in the applicant's compositions. Since one of these mineral components is required for Dingsoyr's cement slurry and not required or called for in any

of the applicant's claims, Dingsoyr can not anticipate applicant's claims.

Since the rejection is also based on obviousness on grounds that the overlapping ranges of amounts are prima facie obvious to one of ordinary skill in the art, it is believed helpful to compare the ranges as best one can.

Dingsoyr expresses his components as a percent based on the weight of cement which is on a different basis than that in applicant's independent claims. To make a comparison applicant will give the broadest interpretation possible to Dingsoyr's formulations. Thus for 100 parts of cement Dingsoyr requires at least the following:

- - - - - - - - - - - - Dingsoyr	- - - - - - - - - -		Applicant
Parts	Component	% Range	% Range
100	cement	<21-91	20-35
5-85	microsilica (silica fume)	< 1-77	< 5
5-250	high density filler	< 2-70	0
0-45	silica flour or silica sand	0-29	50-79

The above upper percentage for silica flour or silica sand was calculated as follows: 45/(100 + 5 + 5 +45) = 29.0%.

The retarder, thinner and fluid loss additive in Dingsoyr's compositions have been ignored since they can be zero and since their effect on the percents would only be to lower Dingsoyr's percentage ranges.

It can be seen that silica flour or silica sand range of amounts is substantially below the range of amounts of quartzitic silica blend (about 50% to about 79%) in the applicant's packageable dry blended cementitious matrix composition as claimed in independent claims 1, 2 and 24. The range of barite, hematite, and/or ilmenite in Dingsoyr, slurry can not overlap with that of

the applicant's claims because these mineral components are not call for in the applicant's claims. Therefore, the applicant's claims can not be anticipated by nor made obvious by Dingsoyr.

Furthermore, omitting the mineral component from Dingsoyr's slurry would defeat the intended purpose of Dingsoyr's slurry since to do so would not produce a high density slurry for the cementation of high pressure oil wells. Such an omission would be a teaching away from that which Dingsoyr fairly suggests is necessary for his invention.

Still further, these three high density materials are excluded from the applicant's packageable dry blended cementitious matrix composition of independent claims 2 and 24 by the transitional phrases of those claims for the same reasons as discussed earlier with regard to the rejection based on Ramme et al.

With regard to applicant's decorative aggregate-containing cementitious slurry as claimed in independent claims 25 and 47, there is no disclosure nor suggestion in Dingsoyr that his slurry should contain an aggregate used for a decorative purpose. Therefore, the range of amounts of the decorative aggregate in applicant's independent claims 25 and 47 do not overlap with Dingsoyr and, therefore, can not be anticipated or made obvious by Dingsoyr.

With regard to applicant's claim 47 for a decorative aggregate-containing cementitious slurry, the dense mineral component of Dingsoyr is also excluded by the transitional phrase "consisting essentially of" in lines 4-5 and therefore can not be made obvious by Dingsoyr.

The question to be asked is where is the motivation for one skilled in the art to look for a cementitious composition

formulated for a particular characteristic (high density) and for a particular utility (for cementation of high pressure oil wells) in the prior art, then remove the component (barite, hematite or ilmenite) in such cementitious composition that contributes to the particular characteristic in the prior art composition so that it is closer to applicant's claimed composition, and use the thusly modified composition for a new purpose (for producing a decorative aggregate-containing surface suitable for light pedestrian traffic), when such use of the modified composition was of no concern in and of the prior art composition. For example, there is no mention of cementitious matrix composition for producing a decorative aggregate-containing cementitious slurry, or a slurry for producing a decorative aggregate-containing surface in Dingsoyr. It is respectfully submitted that the motivation to do so is nonexistent in Dingsoyr and to do so would seem to be "hindsight" based on the applicant's own disclosure.

For the above reasons it is believed that the applicant's independent claims 1, 2, 24, 25 and 47 can not be anticipated by nor made obvious by Dingsoyr. Accordingly, allowance of all of the applicant's claims is requested.

With regard to fly ash, Dingsoyr is silent on the inclusion of fly ash in his concrete or CLSM. Therefore, applicant's claims 15, 16 and 17 that require his packageable dry blended cementitious matrix composition to include fly ash, can not be anticipated nor made obvious by Dingsoyr.

Applicant's new claims 36, 39 and 42 that require that in his packageable dry blended cementitious matrix composition that the particulate material selected from the group consisting of fly ash, silica fume and mixtures thereof, be fly ash, can not be made obvious by Dingsoyr because these claims not only contain fly ash but they do not contain silica fume and there is no suggestion in

Dingsoyr that fly ash can be substituted for silica fume or barite, hematite, or ilmenite.

Likewise, applicant's new claim 46 that requires that in his decorative aggregate-containing cementitious slurry that the packageable dry blended cementitious matrix composition that the particulate material selected from the group consisting of fly ash, silica fume and mixtures thereof, <u>be fly ash</u>, can not be made obvious by Dingsoyr because claim 45 not only contains fly ash but it does not contain silica fume and there is no suggestion in Dingsoyr that fly ash can be substituted for silica fume or barite, hematite, or ilmenite.

Accordingly, it is believed that all of the applicant's claims now in the application are allowable over Dingsoyr and allowance is requested.

****

<u>U.S. Patent No. 6,324,802 B1 to Garrett</u>

Garrett discloses a swimming pool interior finish designed to mask or hide spot etching of the pool finish. Garrett points out that usually pool finishes are pool plaster or marcite which are normally composed of white cement, aggregates such as crushed marble and limestone, and white silica sand (Col. 1, lines 9-13). Garrett discloses that the problem with plaster and marcite is that they tend to stain, etch, scale and show other forms of mineral precipitation and that etching may result in the appearance of generally rounded spots having a size of about 1/8 to 3/4 inch generally referred to as spot etching. Spot etching is said to be due to the increased use of acidic swimming pool and spa sanitizers (Col. 1, lines 21-33).

Garrett further discloses that in the mid 1980s the swimming pool industry began experimenting with exposed aggregate surfaces produced by mixing cement and water with small rounded pebbles or other small aggregates and applying the mixture to the interior of a pool, spa or other water basin. The major advantages of such exposed pebbles, beads or other aggregate are said to make the damage from aggressive water less visible, and that the irregular appearance of the aggregate surface hides many types of surface stains, normal mottling or shade variations in traditional plaster or marcite (Col. 1, line 49 to Col. 2, line 5).

Garrett teaches that severe mineral buildups develop in pools at the water line, with plaster and marcite as well as with exposed aggregate surfaces. With pools lined with ceramic tile at the water line such mineral buildups can be removed. However, with exposed aggregate surfaces such buildups are extremely difficult to remove (Col. 2, lines 42-55).

Another problem mentioned by Garrett is that shrinkage cracks still tend to develop in the finishes (Col. 3, lines 21-22). Garrett teaches that his basin interior finish for contacting an aqueous medium are designed to reduce cracking. (Col. 3, lines 24-29).

Garrett's examples of basins are swimming pools, spas and fountains basins. Garrett's interior finish composition includes

(1) at least one more aggregate,
(2) at least one binder for the aggregate,
(3) at least one pozzolan that must include silica fume, and
(4) at least one set retarder (Col. 9, claim 1).

Garrett teaches that the set retarder is an ingredient which delays setting or hardening of the interior finish produced from the composition and <u>will typically be an inorganic salt with borate</u>

salts preferred, and that it is particularly advantageous for the set retarder to be a polyborate salt such as sodium tetraborate pentahydrate or lithium tetraborate (Col. 4, line 65 to Col. 5, line 6).

Excluding the set retarder limitation, one skilled in the art will know that such unspecified amounts for the four components (i.e. aggregate, binder, silica fume and set retarder) will include a vast number of compositions, quite possibly for a vast number of uses, and quite possibly for totally unrelated types of construction, in addition to Garrett's use in basins, if not limited to a basin designed to contact an aqueous medium and at least compositions similar to those of his nine examples.

The only utility taught and suggested for his product is as an interior finish for a basin, namely a pool, spa or fountain, and in which the interior finish is in contact with an aqueous medium.

The only aggregate that Garrett uses in his nine examples is pebble, except for Example 6 in which the aggregate is about 99% pebble and 1% synthetic ceramic particles. All nine of Garrett's Examples include sodium tetraborate pentahydrate as a retarder, which Garrett has stated is a particularly advantageous retarder.

Garrett further teaches that silica fume increases the resistance of the interior finish to attack by aggressive aqueous media, reduces the thickness of the weak interfacial transition zone between the cement binder and the aggregate or aggregates, and reduces carbonation and the reaction associated with alkali-silica reactivity that can lead to cracks and expansive gel formation (Col. 3, lines 48-59). Since Garrett's product is design to hide spot etching by masking with pebble or similarly sized aggregate, such pebble or pebble-sized aggregate is essentially a required

component of his interior finish composition since without pebble or pebble sized aggregate spot etching will be more easily seen.

Garrett does not disclose the size of the pebble. Therefore, there is no clear teaching of pebble size in Garrett. However, Garrett does teach that the round spots formed by spot etching have a size of about 1/8 to 3/4 inch (Col. 1, line 24). If pebble is to hide such spots the pebble must be about the same size as such spots. However, pebble is defined in McGraw-Hill, Dictionary of Scientific and Technical Terms, 1994, page 1088, copy enclosed, as:

> A clast, larger than a granule and smaller than a cobble having a diameter in the range of 4-64 mm (0.16 inch to 2.54 inch).

Applicant's independent claims 1, 2 and 24, for a packageable dry blended cementitious matrix composition requires

(1) a hydraulic cement selected from the group consisting of Type V portland cement and white portland cement,
(2) a quartzitic silica blend, and
(3) fly ash or silica fume or both,

none of which are coarse aggregate.

Therefore, since the applicant's independent claims 1, 2 and 24, for a packageable dry blended cementitious matrix composition, do not call for coarse aggregate , nor a pebble or pebble-sized aggregate, these claims are not anticipated nor disclosed nor suggested by Garrett's pebble or pebble-sized aggregate-containing compositions illustrated by his Examples 1-9.

Since the grounds of rejection is based on the allegation of overlapping ranges of amounts of applicant's components with those of Garrett it is believed helpful to review such amounts in Garrett.

In Garrett's Examples 1-9, the range of the amounts of cement is from 46.0% (Example 4) to 46.7% (Example 1). No other percentages on a dry basis of cement in Garrett's interior finish are disclosed.

The amount of hydraulic cement in applicant's packageable dry blended cementitious matrix compositions as claimed in independent claims 1, 2 and 24 is from about 20% to about 35%. Clearly, the range of amounts of cement in Garrett and that in applicant's independent claims 1, 2 and 24 do not overlap with that taught or suggested by Garrett's nine Examples. In fact there appears to be a substantial difference in the amount of cement in Garrett interior finish than that claimed by the applicant in independent claims 1, 2 and 24. Accordingly, it is believed that a prima facie case of obviousness has not been established.

Furthermore, when a slurry is prepared from applicant's packageable dry blended cementitious matrix composition, and an aggregate used for a decorative purpose and water, the percentages of hydraulic cement in the slurry on a dry basis becomes even smaller than the about 20% to about 35% in the packageable dry blended cementitious matrix composition claimed in applicant's independent claims 1, 2 and 24. For example, when 60 lbs of dry blended cementitious composition, i.e. packageable dry blended cementitious matrix composition, and 20-50 lbs. of decorative aggregate (an aggregate used for a decorative purpose) as claimed in applicant's independent claims 25 and 47, are used to form a decorative aggregate-containing cementitious slurry, the range of amounts of hydraulic cement becomes even smaller and drops to about 11% to about 26%. These percents are calculated as follows:

(20% x 60 lbs)/(60 lbs + 50 lbs) = 11% minimum cement on a dry basis, and

(35% x 60 lbs)/(60 lbs + 20 lbs) = 26% maximum cement on a dry basis.

Thus, range of amounts of cement in Garrett compositions on a dry basis, i.e. 46.1% - 46.7%, does not overlap with the range of amount of hydraulic cement in applicant's decorative aggregate-containing cementitious slurry on a dry basis, i.e about 11% - 26%, as claimed in applicant's independent claims 25 and 47. Again there appears to be a substantial difference in the amount of cement in Garrett interior finish slurry than that claimed by the applicant in independent slurry claims 25 and 47 and such claimed ranges do not overlap. Therefore, it is believed that a prima facie case of obviousness has not been established with regard to applicant's independent claims 1, 2 and 24.

Similarly range of amounts of aggregate (pebbles and ceramic particles) in Garrett's Examples 1-9 ranges from 49.0% (Example 4) to 50.0% (Example 8) on a dry basis.

The applicant's range of amounts of aggregates (quartzitic silica blend plus decorative aggregate) in his slurry as claimed in independent claims 25 and 47 is about 62.5% to about 88.6% on a dry basis, which does not overlap with Garrett's range of amounts. The applicant's percentages of aggregate are calculated as follows:

((50% x 60 lbs) + 20 lbs)/80 lbs = 62.5% minimum aggregate on a dry basis, and

((79% x 60 lbs) + 50 lbs)/110 lbs = 88.6% maximum aggregate on a dry basis.

Therefore, the range of amounts of aggregate in applicant's slurry do not overlap. Accordingly for this reason it is believed that a prima facie case of obviousness has not been established with regard to applicant's independent claims 24 and 47.

It is respectfully submitted

(1) that since the intended utility of Garrett's composition as an interior finish in a basin for contacting an aqueous medium is unrelated to the intended utility of

the applicant's compositions to produce a decorative aggregate-containing surface suitable for light pedestrian traffic, and

(2) that since the cement ranges in applicant's independent claims 1, 2, 24, 25 and 47 do not overlap with that disclosed or suggested by Garrett,

that Garrett does not anticipate nor disclose nor suggest the applicant's packageable dry blended cementitious matrix composition as claimed in applicant's independent claims 1, 2 and 24, nor applicant's decorative aggregate-containing cementitious slurry as claimed in applicant's independent claims 25 and 47.

Furthermore, applicant's claim 7 and newly added dependent claims 35, 38 and 41 for a packageable dry blended cementitious matrix composition, which depend on claim 1, 2 and 24, respectively, requires that all of the particles of the quartzitic silica blend pass through Standard Sieve Size No. 4 (about 0.187 inch) thereby reducing the maximum particles well below the maximum particle size for a fine aggregate. Thus, applicant's claims 7 and 35, 38 and 41 are not anticipated nor made obvious by Garrett's pebble-containing dry mix.

The applicant's decorative aggregate-containing cementitious slurry as claimed in independent claims 25 and 47 requires water in an amount that when mixed with the packageable dry blended cementitious matrix composition and the decorative aggregate produces slurry having a slump of at least about 2 inches. Applicant's dependent claim 28 requires that the amount of water in the decorative aggregate-containing cementitious slurry produces a slurry having a slump of at least about 3 inches. The applicant's dependent claim 29 requires that the amount of water in the decorative aggregate-containing cementitious slurry produces a slurry having a slump of from about 3 inches to about 5 inches.

Garrett does not disclose what the slump value is of his interior finish slurry. Rather Garrett discloses only that:

> "The dispersing agent allows the amount of silica fume in a cementitious composition to be increased without significantly increasing the water demand. Thus, when a cementitious composition is mixed with water, the weight ratio of water to cementitious material should be no higher than 0.55, and ideally no higher than 0.5. If the weight ratio of water to cementitious material exceeds 0.55, the strength of the final product is negatively affected." (Col. 9, lines 40-48).

This ratio in all of Garrett's nine examples is about 0.5, where the cementitious material is the cement plus silica fume.

Thus, from the disclosure of Garrett it is not believed that one skilled in the art will know what the slump value of Garrett interior finish slurry is, however, it is believed that slump values greater than about 1 inch would not adhere to a vertical pool wall. Accordingly, it is not believed that Garrett's interior finish slurry anticipate or makes obvious applicant's decorative aggregate-containing cementitious slurry as set forth in independent claims 25 and 47 which require a slump value of at least about 2 inches, nor claim 28 which requires a slump value of at least about 3 inches, nor claim 29 which requires a slump value of from about 3 inches to about 5 inches.

The amount of water in a cementitious composition is not a variable that may be adjusted merely to achieve a required slump without regard to the intended use of the composition since the amount of water will effect not only the slump value but also other properties of the slurry and the set product. In fact all components of the mix and the percentages of each components are important. Furthermore, the time to mix and install cementitious compositions are also important which makes the availability of

premixes and their compositions also important to producing an economical quality product for the intended use.

With this in mind, and returning to applicant's packageable dry blended cementitious matrix composition, it is clear that the aggregate that Garrett intends to use is pebble or similarly sized aggregate. In all of Garrett's 9 Examples the aggregate is pebble. However, Garrett states that the preferred aggregate is pebble although other aggregates can be employed among which are synthetic ceramic particles, spherical plastic beads, spherical glass beads, tumbled glass particles, crushed calcite, crushed rock, silica sand and calcite sand (Col. 4, lines 32-45). It is respectfully submitted that use of only a fine aggregate in Garrett's interior finish would be in conflict with the intention of Garrett to mask or hide spot etching, and therefore using only a fine aggregate without pebble or pebble-sized aggregate would be a teaching away from the clear purpose of Garrett's interior finish, namely to mask or hide spot etching, surface stains, mottling and shade variations.

> "Even when obviousness is based on a single prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference. See B.F. Goodrich Co. v. Aircraft Breaking Sys. Corp., 72 F.3d 1577, 1582, 37 USPQ 2d 1314, 1318 (Fed.Cir. 1996)."
>
> ....
>
> "While the test for establishing an implicit teaching, motivation, or suggestion is what the combination of these two statements of Evans [a prior art reference] would have to suggest to those of ordinary skill in the art, the two statements cannot be viewed in the abstract. Rather, they must be considered in the context of the teaching of the entire reference. Further, a rejection cannot be predicated on the mere identification in Evans [the reference] of individual components of claimed

> limitations. Rather, particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed." In re Kotzab 217 F.3d 1365 (Fed. Cir. 6/30/2000).

Thus, it is respectfully submitted that Garrett's statements on aggregate size should not be viewed in the abstract, but rather only in the context of his entire disclosure and what he seek to accomplish.

Furthermore, what is the amount of fine aggregate that one skilled in the art from a reading of Garrett would use in preparing Garrett's interior finish slurry. Garrett appears to be totally silent on this point. There is no fine aggregate in Garrett's nine examples. Therefore, there is no clear teaching in Garrett of the amount of fine aggregate in his interior finish. Since there is no disclosure of the amount of fine aggregate in Garrett for his interior finish, how is one skilled in the art to arrive at the amount of quartzitic silica blend in applicant's packageable dry blended cementitious matrix composition from Garrett's disclosure except by the applicant's disclosure.

Again applicant submits that relative to rejections predicated on 35 U.S.C. 103, prior patents are references for only what <u>they clearly disclose or suggest</u>. In re Randol and Redford, Idem.

With regard to <u>fly ash</u>, Garrett is silent on the inclusion of fly ash in his interior finish. Therefore, applicant's claims 15, 16 and 17 that require his packageable dry blended cementitious matrix composition to <u>include fly ash</u>, can not be anticipated or made obvious by Garrett which does not mention fly ash.

Similarly, applicant's new claims 36, 39 and 42 that require that in the packageable dry blended cementitious matrix composition

that the particulate material selected from the group consisting of fly ash, silica fume and mixtures thereof, be fly ash, can not be made obvious by Garrett because the claims 36, 39 and 42 not only contains fly ash (which Garrett's interior finish does not) but claims 36, 39 and 42 do not contain silica fume (which Garrett's interior finish does), and there is no suggestion in Garrett that fly ash can be substituted for silica fume.

Likewise, applicant's new claim 45 that requires that in his decorative aggregate-containing cementitious slurry that the packageable dry blended cementitious matrix composition that the particulate material selected from the group consisting of fly ash, silica fume and mixtures thereof, be fly ash, can not be made obvious by Garrett because claim 45 not only contains fly ash but it does not contain silica fume and there is no suggestion in Garrett that fly ash can be substituted for silica fume or barite, hematite, and/or ilmenite.

Therefore, while Garrett's compositions for an interior finish in contact with an aqueous medium are interesting, it is respectfully submitted that there are many reasons why Garrett does not disclose or suggest the applicant's packageable dry blended cementitious matrix composition as claimed in independent claims 1, 2 and 24, nor his decorative aggregate-containing cementitious slurry for producing a durable decorative aggregate-containing surface for light pedestrian traffic as claimed in independent claims 25 and 47.

As mentioned earlier, excluding the set retarder limitation, one skilled in the art will know that such unspecified amounts for the four components (i.e. aggregate, binder, silica fume and set retarder) will include a vast number of compositions, quite possibly for a vast number of uses, and quite possibly for totally unrelated types of construction, in addition to Garrett's use in

basins, if not limited to a basin designed to contact an aqueous medium and at least compositions similar to those of his nine examples.

With this in mind, it has been held that a prior art reference that discloses a generic formula encompassing a claimed composition would not have provided the requisite motivation to select that composition because the reference (a) disclosed a "vast number" of possibilities, and (b) gave as "typical", "preferred," and "optimum" examples that "are different from and more complex than" the claimed composition. In re Baird, 16 F.3d 380, 29 USPQ2d 1550 (Fed. Cir. 1994).

Garrett further teaches that it is particularly advantageous for the set retarder to be a polyborate salt such as sodium tetraborate pentahydrate or lithium tetraborate. (Col. 4, line 65 to Col. 5, line 6).

None of applicant's claims call for a borate salt set retarder, including the sodium tetraborate pentahydrate or lithium tetraborate required in Garrett's claim 1. There is no disclosure nor suggestion in Garrett that fly ash can be used as a substitute set retarder in his interior finish compositions.

Accordingly, it is believed that all of the applicant's claims now in the application are allowable over Garrett and allowance is requested.

****

Japanese Patent No. JP 066157115 - Abstract only to Sato et al.

All of applicant's claims stand rejected as anticipated by or obvious over Sato et al. (abstract only). Another English abstract of the Sato et al. patent obtained from the esp@cenet database,

copy enclosed, is believed to be useful in better understanding this reference.

Based on these two translated abstracts applicant believes Sato et al. discloses a composition with the following weight percentage:

(1)	30-70%	portland cement,
(2)	3-30%	fine blast furnace slag powder and/or fly ash,
(3)	3-30%	silica fume,
(4)	0-50%	silica sand,
(5)	0- 5%	gypsum,
(6)	0- 1%	thickeners,
(7)	0- 1%	fibers, with (to cement)
(8)	0-2.5%	superplasticizers,
(9)	1- 9%	epoxy resins (as resin solid), and
(10)		water, and

that the mixture formed therefrom is extruded to produce a molded body superior in bending strength and water resistance.

Applicant's packageable dry blended cementitious matrix composition as claimed in independent claims 1, 2 and 24 requires 50-79% quartzitic silica blend <u>but no epoxy resins</u>, whereas Sato et al. requires 0-50% silica sand and <u>1-9% epoxy resins</u>.

It is believed that if the epoxy resins were omitted from the composition of Sato et al. it would not produce a molded body superior in bending strength and water resistance. Such an omission would therefore be <u>a teaching away</u> from that which Sato et al. fairly suggest is necessary for their invention to have the stated properties, namely be extrudable and have superior bending strength and water resistance.

Applicant's claim 1 for a packageable dry blended cementitious matrix composition specifically <u>excludes reactive resins</u> and hardeners therefor, <u>epoxy</u> and mixtures thereof, and gypsum. The <u>transitional phases</u> in applicant's similar independent claims 2 and 24 are not open to the inclusion of epoxy resins as discussed earlier with regard to Ramme et al. Therefore, it is not believed that the translated abstracts of Sato et al. anticipate or establish a prima facie case of obviousness of applicant's independent claims 1, 2 and 24.

Applicant's independent claims 25 and 47 for decorative aggregate-containing cementitious slurry require <u>an aggregate used for decorative purpose</u>, whereas Sato et al. does not. The amount of decorative aggregate in applicant's claims 25 and 47 is from about 25% to about 45%. Therefore, it is not believed that the English abstracts of Sato et al. anticipate or establish a prima facie case of obviousness of applicant's independent claims 25 and 47.

Since the utility of Sato et al. composition is to form an <u>extruded molded body</u>, whereas the utility of applicant's

(1) packageable dry blended cementitious matrix <u>composition</u> as claimed in independent claims 1, 2 and 24, and

(2) decorative aggregate-containing cementitious <u>slurry</u> as claimed in independent claims 25 and 47,

is to produce a decorative aggregate-containing surface for light pedestrian traffic, it is not believed that one skilled in the art would be motivated to modify the composition of Sato et al. to produce the packageable dry blended cementitious matrix composition, or the decorative aggregate-containing cementitious slurry of the applicant to produce a decorative aggregate-containing surface.

Excluding the requirement for the epoxy resin limitation for the composition of Sato et al., one skilled in the art will know

that such broad amounts, four of which include zero percentage (silica sand, gypsum, thickeners and fibers), and four of which require some finite amount (portland cement), will include a vast number of compositions, quite possibly for a vast number of uses, and quite possibly for totally unrelated types of construction, in addition to Sato et al.'s use for producing a extrudable product, if not at least limited to extrudable products having an epoxy resin in the composition. In re Baird, Idem.

There isn't any motivation to one skilled in the art in Sato et al. to delete required epoxy resins needed for extrudable product to make a composition for totally different and unrelated product. Therefore, it is not believed that the applicant's packageable dry blended cementitious matrix composition as set forth in independent claims 1, 2 and 24, and decorative aggregate-containing cementitious slurry as set forth in independent claims 25 and 47 are anticipated or made obvious by Sato et al. Accordingly reconsideration and allowance of all of Applicants' claims is requested.

Respectfully submitted,

F. E. Logan, 4-25-05

F. Eugene Logan, Reg. No. 27,352
Attorney for the Applicant
Telephone (714) 730-5553
Fax (714) 730-2119

827B42Am.#Dell

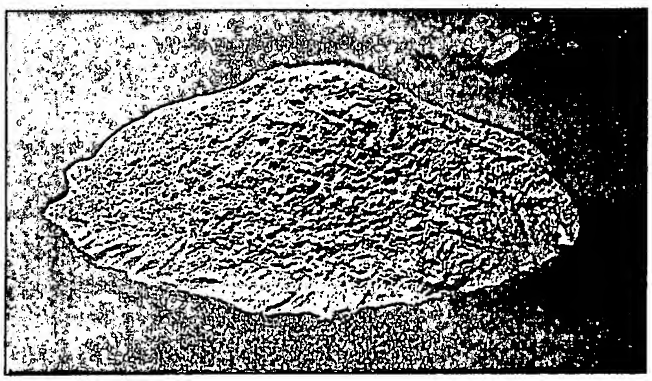


Fig. 3-3. Fly ash, a powder resembling cement, has been used in concrete since the 1930s. (69799)

common. Supplementary cementitious materials are used in at least 60% of ready mixed concrete (PCA 2000). ASTM C 311 provides test methods for fly ash and natural pozzolans for use as supplementary cementitious material in concrete.

FLY ASH

Fly ash, the most widely used supplementary cementitious material in concrete, is a byproduct of the combustion of pulverized coal in electric power generating plants. Upon ignition in the furnace, most of the volatile matter and carbon in the coal are burned off. During combustion, the coal's mineral impurities (such as clay, feldspar, quartz, and shale) fuse in suspension and are carried away from the combustion chamber by the exhaust gases. In the process, the fused material cools and solidifies into spherical glassy particles called fly ash (Fig. 3-2). The fly ash is then collected from the exhaust gases by electrostatic precipitators or bag filters. Fly ash is a finely divided powder resembling portland cement (Fig. 3-3).

Most of the fly ash particles are solid spheres and some are hollow cenospheres. Also present are plerospheres, which are spheres containing smaller spheres. Ground materials, such as portland cement, have solid angular particles. The particle sizes in fly ash vary from less than 1 µm (micrometer) to more than 100 µm with the typical particle size measuring under 20 µm. Only 10% to 30% of the particles by mass are larger than 45 µm. The surface area is typically 300 to 500 m²/kg, although some fly ashes can have surface areas as low as 200 m²/kg and as high as 700 m²/kg. For fly ash without close compaction, the bulk density (mass per unit volume including air between particles) can vary from 540 to 860 kg/m³ (34 to 54 lb/ft³), whereas with close packed storage or vibration, the range can be 1120 to 1500 kg/m³ (70 to 94 lb/ft³).

Fly ash is primarily silicate glass containing silica, alumina, iron, and calcium. Minor constituents are magnesium, sulfur, sodium, potassium, and carbon. Crystalline compounds are present in small amounts. The relative density (specific gravity) of fly ash generally ranges between 1.9 and 2.8 and the color is generally gray or tan.

ASTM C 618 (AASHTO M 295) Class F and Class C fly ashes are commonly used as pozzolanic admixtures for general purpose concrete (Fig. 3-4). Class F materials are generally low-calcium (less than 10% CaO) fly ashes with

Table 3-1. Specifications and Classes of Supplementary Cementitious Materials

Ground granulated iron blast-furnace slags—ASTM C 989 (AASHTO M 302)
- Grade 80
  - Slags with a low activity index
- Grade 100
  - Slags with a moderate activity index
- Grade 120
  - Slags with a high activity index

Fly ash and natural pozzolans—ASTM C 618 (AASHTO M 295)
- Class N
  - Raw or calcined natural pozzolans including:
    Diatomaceous earths
    Opaline cherts and shales
    Tuffs and volcanic ashes or pumicites
    Calcined clays, including metakaolin, and shales
- Class F
  - Fly ash with pozzolanic properties
- Class C
  - Fly ash with pozzolanic and cementitious properties

Silica fume—ASTM C 1240

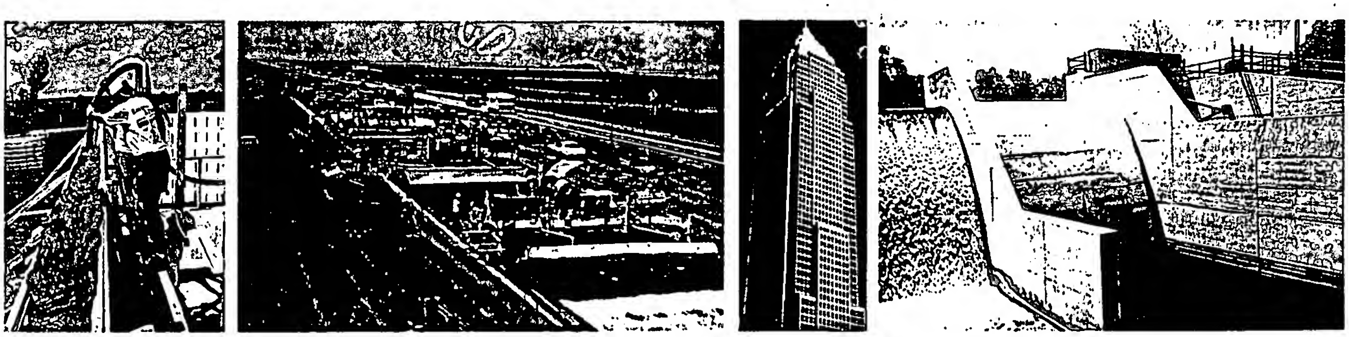


Fig. 3-4. Fly ash, slag, and calcined clay or calcined shale are used in general purpose construction, such as (left to right) walls for residential buildings, pavements, high-rise towers, and dams. (67279, 48177, 69554, 69555)

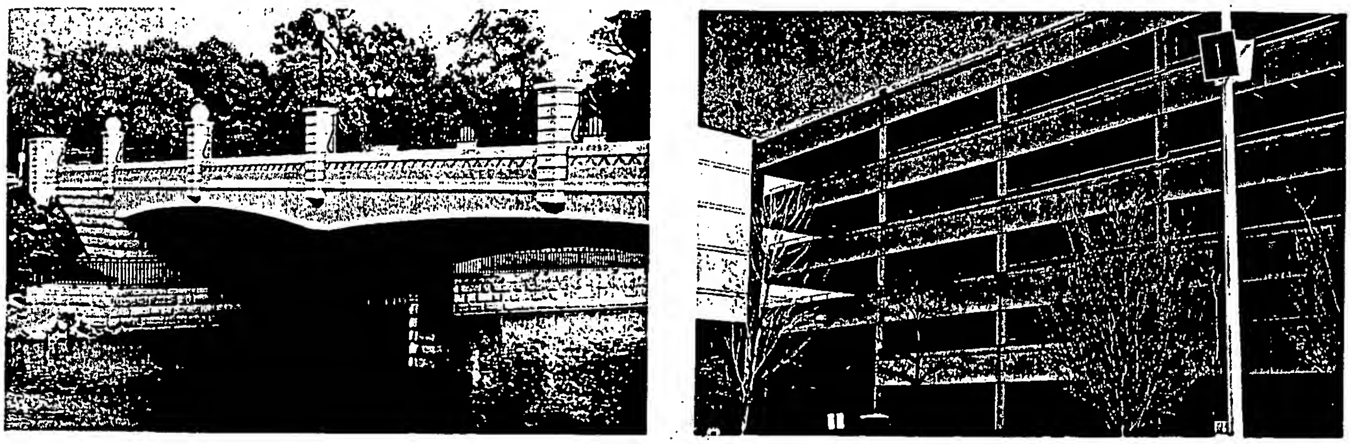


Fig. 3-9. Although they can be used in general construction, silica fume and metakaolin are often used in applications such as (left) bridges and (right) parking garages to minimize chloride penetration into concrete. (68681, 69542)

ground granulated blast furnace slag and ACI 233 (1995) provides an extensive review of slag.

SILICA FUME

Silica fume, also referred to as microsilica or condensed silica fume, is a byproduct material that is used as a pozzolan (Fig. 3-7). This byproduct is a result of the reduction of high-purity quartz with coal in an electric arc furnace in the manufacture of silicon or ferrosilicon alloy. Silica fume rises as an oxidized vapor from the 2000°C (3630°F) furnaces. When it cools it condenses and is collected in huge cloth bags. The condensed silica fume is then processed to remove impurities and to control particle size.

Condensed silica fume is essentially silicon dioxide (usually more than 85%) in noncrystalline (amorphorous) form. Since it is an airborne material like fly ash, it has a spherical shape (Fig. 3-8). It is extremely fine with particles less than 1 µm in diameter and with an average diameter of about 0.1 µm, about 100 times smaller than average cement particles.

Condensed silica fume has a surface area of about 20,000 m^2/kg (nitrogen adsorption method). For comparison, tobacco smoke's surface area is about 10,000 m^2/kg. Type I and Type III cements have surface areas of about 300 to 400 m^2/kg and 500 to 600 m^2/kg (Blaine), respectively.

The relative density of silica fume is generally in the range of 2.20 to 2.5. Portland cement has a relative density of about 3.15. The bulk density (uncompacted unit weight) of silica fume varies from 130 to 430 kg/m^3 (8 to 27 lb/ft^3).

Silica fume is sold in powder form but is more commonly available in a liquid. Silica fume is used in amounts between 5% and 10% by mass of the total cementitious material. It is used in applications where a high degree of impermeability is needed (Fig. 3-9) and in high-strength concrete. Silica fume must meet ASTM C 1240. ACI 234 (1994) and SFA (2000) provide an extensive review of silica fume.

NATURAL POZZOLANS

Natural pozzolans have been used for centuries. The term "pozzolan" comes from a volcanic ash mined at Pozzuoli, a village near Naples, Italy, following the 79 AD eruption of Mount Vesuvius. However, the use of volcanic ash and calcined clay dates back to 2000 BC and earlier in other cultures. Many of the Roman, Greek, Indian, and Egyptian pozzolan concrete structures can still be seen today, attesting to the durability of these materials.

The North American experience with natural pozzolans dates back to early 20th century public works projects, such as dams, where they were used to control temperature rise in mass concrete and provide cementitious material. In addition to controlling heat rise, natural pozzolans were used to improve resistance to sulfate attack and were among the first materials to be found to mitigate alkali-silica reaction.

The most common natural pozzolans used today are processed materials, which are heat treated in a kiln and then ground to a fine powder (Figs. 3-10, 3-11 and 3-12); they include calcined clay, calcined shale, and metakaolin.

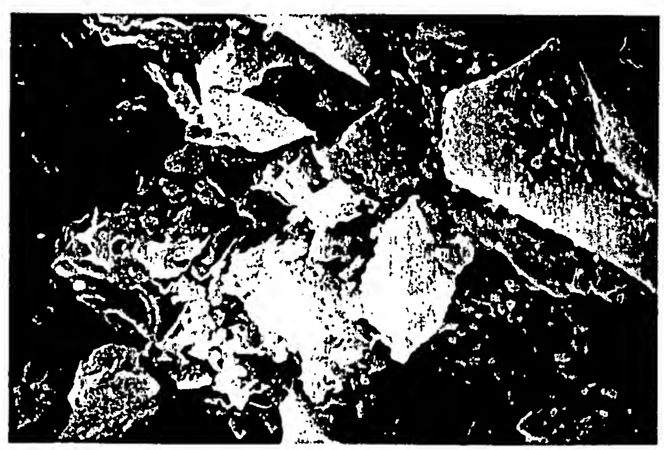
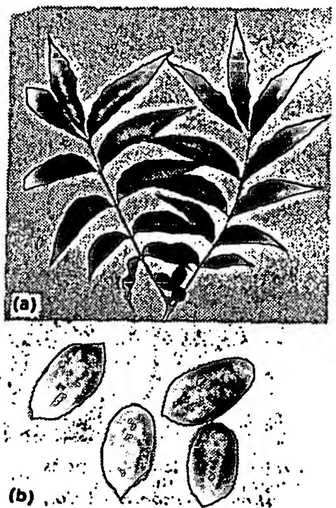


Fig. 3-10. Scanning electron microscope micrograph of calcined shale particles at 5000X. (69543)

Mc Graw-Hill, Dictionary of Scientific and Technical Terms 1974

PECAN

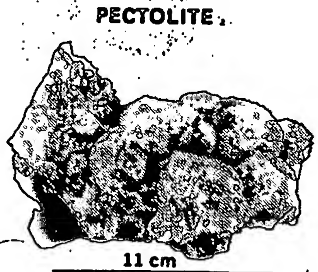


Pecan. *(a)* Leaves and fruit. *(b)* Hulled nuts.

PECTINIBRANCHIA

Shell of the snail *Orthonema*, from the Pennsylvanian-Permian. *(From R. R. Shrock and W. H. Twenhofel, Principles of Invertebrate Paleontology, 2d ed., McGraw-Hill, 1953)*

PECTOLITE



...lar masses of needlelike ...olite crystals with calcite at left, found in Paterson, New Jersey. *(American Museum of Natural History Specimen)*

Pearson Type I distribution *See* beta distribution.

pea-soup fog [METEOROL] Any particularly dense fog.

peat [GEOL] A dark-brown or black residuum produced by the partial decomposition and disintegration of mosses, sedges, trees, and other plants that grow in marshes and other wet places.

peat bed *See* peat bog.

peat bog [GEOL] A bog in which peat has formed under conditions of acidity. Also known as peat bed; peat moor.

peat formation [GEOCHEM] Decomposition of vegetation in stagnant water with small amounts of oxygen, under conditions intermediate between those of putrefaction and those of moldering.

peat moor *See* peat bog.

peat moss [ECOL] Moss, especially sphagnum moss, from which peat has been produced.

peat-sapropel [GEOL] A product of the degradation of organic matter that is transitional between peat and sapropel. Also known as sapropel-peat.

peat soil [GEOL] Soil containing a large amount of peat; it is rich in humus and gives an acid reaction.

peat wax [MATER] A hard, waxy material extracted from peat; it is similar to, and a substitute for, montan wax.

peau de soie [TEXT] Soft silk satin-textured fabric having a slight luster and faintly showing fine ribs in the filling.

pebble [GEOL] A clast, larger than a granule and smaller than a cobble having a diameter in the range of 4–64 millimeters. Also known as pebblestone. [MINERAL] *See* rock crystal.

pebble armor [GEOL] A desert armor made up of rounded pebbles.

pebble-bed reactor [NUCLEO] A nuclear reactor in which the fuel consists of small spheres or pellets stacked in the core; the reaction rate is controlled by coolant flow and by loading and unloading pellets.

pebble coal [GEOL] Coal that is transitional between peat and brown coal.

pebble heater [CHEM ENG] Gas-heating device (for air, hydrogen, methane, and steam) in which heat is transferred to the gas via a countercurrent movement of preheated pebbles.

pebble mill [MECH ENG] A solids size-reduction device with a cylindrical or conical shell rotating on a horizontal axis, and with a grinding medium such as balls of flint, steel, or porcelain.

pebbles [MATER] Grinding media for pebble mills, usually balls of hard flint or hard burned white porcelain.

pebblestone *See* pebble.

pebble-weave [TEX] Of a material, having an irregular texture produced by weaving with shrunken and twisted yarn.

pebbling *See* orange peel.

pebbly mudstone [GEOL] A delicately laminated till-like conglomeratic mudstone.

pebbly sand [GEOL] An unconsolidated sedimentary deposit containing at least 75% sand and up to a maximum of 25% pebbles.

pébrine [INV ZOO] A contagious protozoan disease of silkworms and other caterpillars caused by *Nosema bombycis*.

pecan [BOT] *Carya illinoensis*. A large deciduous hickory tree in the order Fagales which produces an edible, oblong, thin-shelled nut.

peccary [VERT ZOO] Either of two species of small piglike mammals in the genus *Tayassu*, composing the family Tayassuidae.

peck [MECH] Abbreviated pk. 1. A unit of volume used in the United States for measurement of solid substances, equal to 8 dry quarts, or ¼ bushel, or 537.605 cubic inches, or 0.00880976754172 cubic meter. 2. A unit of volume used in the United Kingdom for measurement of solid and liquid substances, although usually the former, equal to 2 gallons, or approximately 0.00909218 cubic meter.

pecking order [PSYCH] A social hierarchy of prestige, dominance, or authority. [VERT ZOO] A hierarchy of social dominance within a flock of poultry where each bird is allowed to peck another lower in the scale and must submit to pecking by one of higher rank.

Peclet number [CHEM ENG] Dimensionless group used to determine the chemical reaction similitude for the scale-up from pilot-plant data to commercial-sized units; incorporates heat capacity, density, fluid velocity, and other pertinent physical parameters.

Pecora [VERT ZOO] An infraorder of the Artiodactyla; includes those ruminants with a reduced ulna and usually with antlers, horns, or deciduous horns.

pecten [ZOO] Any of various comblike structures possessed by animals.

Pectinidae [INV ZOO] A family of bivalve mollusks in the order Anisomyaria; contains the scallops.

pectic acid [BIOCHEM] A complex acid, partially demethylated, obtained from the pectin of fruits.

pectin [BIOCHEM] A purified carbohydrate obtained from the inner portion of the rind of citrus fruits, or from apple pomace; consists chiefly of partially methoxylated polygalacturonic acids.

Pectinariidae [INV ZOO] The cone worms, a family of polychaete annelids belonging to the Sedentaria.

pectinase [BIOCHEM] An enzyme that catalyzes the transformation of pectin into sugars and galacturonic acid.

pectinesterase [BIOCHEM] An enzyme that catalyzes the hydrolytic breakdown of pectins to pectic acids.

pectineus [ANAT] A muscle arising from the pubis and inserted on the femur.

Pectinibranchia [INV ZOO] An order of gastropod mollusks which contains many families of snails; respiration is by means of ctenidia, the nervous system is not concentrated, and sexes are separate.

Pectobothridia [INV ZOO] A subclass of parasitic worms in the class Trematoda, characterized by caudal hooks or hard posterior suckers or both.

pectolite [MINERAL] $NaCa_2Si_3O_8(OH)$ A colorless, white, or gray inosilicate, crystallizing in the monoclinic system and having a vitreous to silky luster; hardness is 5 on Mohs scale, and specific gravity is 2.75.

pectoral fin [VERT ZOO] One of the pair of fins of fishes corresponding to forelimbs of a quadruped.

pectoral girdle [ANAT] The system of bones supporting the upper or anterior limbs in vertebrates. Also known as shoulder girdle.

pectoralis major [ANAT] The large muscle connecting the anterior aspect of the chest with the shoulder and upper arm.

pectoralis minor [ANAT] The small, deep muscle connecting the third to fifth ribs with the scapula.

peculiar part [ORD] A part of ordnance for which the design is controlled by a single manufacturer, and the use is restricted to items produced by a single manufacturer.

peculiar star [ASTRON] A star that does not fit into a standard spectral classification.

peculiar velocity [ASTRON] Superposed on the systematic rotation of the galaxy are individual motions of the stars; each star moves in a somewhat elliptical orbit and therefore shows a velocity of its own (peculiar velocity) to the local standard of rest, the standard moving in a circular orbit around the galactic center.

pedal [BIOL] Of or pertaining to the foot. [DES ENG] A lever operated by foot.

pedal disk [INV ZOO] The broad, flat base of many sea anemones, used for attachment to a substrate.

pedalfer [GEOL] A soil in which there is an accumulation of sesquioxides; it is characteristic of a humid region.

pedal ganglion [INV ZOO] One of the paired ganglia supplying nerves to the foot muscles in most mollusks.

pedal gland *See* foot gland.

pedate [BIOL] 1. Having toelike parts. 2. Having a foot. 3. Having tube feet.

pedestal [CIV ENG] 1. The support for a column. 2. A metal support carrying one end of a bridge truss or girder and transmitting any load to the top of a pier or abutment. [ELECTR] *See* blanking level. [ENG] A supporting part or the base of an upright structure, such as a radar antenna. [GEOL] A relatively slender column of rock supporting a wider rock mass and formed by undercutting as a result of wind abrasion or differential weathering. Also known as rock pedestal.

pedestal boulder [GEOL] A rock mass supported on a rock pedestal. Also known as pedestal rock.

pedestal level *See* blanking level.

EXTRUSION MOLDING METHOD OF INORGANIC MOLDED BODY

Patent number: JP6157115

Publication date: 1994-06-03

Inventor: SATO TERUYUKI; SAKAI SHINRIYOKU; MATSUNAGA TOYOJI; NARABE GANJI; YAMAMOTO SHINJI

Applicant: SHOWA DENKO KK

Classification:

- international: C04B14/16; C04B28/04; B28B3/20; C04B24/28; C04B28/04; C04B18/14; C04B18/08; C04B22/06; C04B22/14; C04B24/38; C04B16/06; C04B24/22; C04B24/28

- european:

Application number: JP19920160350 19920527

Priority number(s): JP19920160350 19920527

Abstract of **JP6157115**

PURPOSE:To obtain an inorganic molded body excellent in a extrusion molding property and superior in the bending strength and in the water resistance by extruding a mixture mixed a powder compound consisting of cement and silica fume, etc., with a prescribed quantity of high performance water reducing agent and an epoxy resin, etc. CONSTITUTION:A powder compound consisting of, % by weight, 30-70% Portland cement, 3-30% fine blast furnace slag powder and/or fly ash, 3-30% silica fume, 0-50% silica sand powder, and 0-5% gypsum, etc., is prepared. For 100% of the compound, 0-2.5% (for the cement) the high performance water reducing agent (for example, naphthalene sulfonic acid), 1-9% (as the resin solid content) the epoxy resin and water are uniformly mixed. Next the compound is extruded, thus the inorganic molded body superior in bending strength and water resistance is obtained.